

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A hybrid driving unit comprising:

an input shaft for inputting motive power from an internal combustion engine;

an output shaft disposed on an axis in line with said input shaft and engaged with driving wheels;

a first electric motor disposed on said axis and comprising a stator and a rotor;

a power-splitting planetary gear disposed on said axis and comprising a first rotary element coupled with said input shaft, a second rotary element coupled with said rotor of said first electric motor and a third rotary element coupled with said output shaft;

a second electric motor disposed on said axis and comprising a stator and a rotor; and

a transmission disposed on said axis, which shifts and transmits revolution of said rotor of said second electric motor to said output shaft;

wherein said first electric motor, said power-splitting planetary gear, said second electric motor and said transmission are provided in a casing member while being disposed in line on said axis;

wherein said stators of said first and second electric motors are fixed to said casing member; ~~and~~

wherein said first electric motor, said power-splitting planetary gear, said second electric motor and said transmission are disposed on said axis such that said second electric motor and said transmission ~~is-are~~ positioned on a side of a vehicle closer to said internal combustion engine than said first electric motor and said power-splitting planetary gear; and

wherein said transmission is an automatic transmission having at least two stages or a continuous variable transmission.

2. (previously presented): The hybrid driving unit as set forth in claim 1, wherein said second electric motor is disposed in a foremost position in said vehicle among said first electric motor, said power-splitting planetary gear, said second electric motor and said transmission.

3. (previously presented): The hybrid driving unit as set forth in claim 2, wherein said transmission is provided adjacent to said second electric motor.

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4. (previously presented): The hybrid driving unit as set forth in claim 2, wherein supporting members extending from said casing member support both sides of said rotor of said second electric motor through an intermediary of bearing members; and

wherein one of said supporting members, which is between said second electric motor and said transmission, forms a hydraulic chamber of a hydraulic actuator of said transmission.

5. (previously presented): The hybrid driving unit as set forth in claim 4, wherein at least a part of said hydraulic chamber is provided on an inner diametric side of said stator of said second electric motor.

6. (previously presented): The hybrid driving unit as set forth in claim 1, wherein said second electric motor, said transmission, said power-splitting planetary gear and said first electric motor are disposed in order from a side of said vehicle that is closest to said internal combustion engine.

7. (previously presented): The hybrid driving unit as set forth in claim 6, wherein said input shaft passes through an inner peripheral side of said second electric motor and said transmission;

wherein said input shaft is coupled with a ring gear;

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wherein said output shaft passes through an inner peripheral side of said power-splitting planetary gear and said first electric motor; and

wherein said output shaft is coupled with an output element of said transmission through an outer peripheral side of said power-splitting planetary gear.

8. (previously presented): The hybrid driving unit as set forth in claim 7, wherein said power-splitting planetary gear comprises a double pinion planetary gear train;

wherein said input shaft passes between said transmission and said power-splitting planetary gear;

wherein said input shaft is coupled with a ring gear of said double pinion planetary gear train;

wherein said output shaft is coupled with a carrier of said double pinion planetary gear train on a side of said transmission through the inner peripheral side of said power-splitting planetary gear;

wherein said rotor of said first electric motor is coupled with a sun gear of said double pinion planetary gear train; and

wherein said output element of said transmission is coupled with said carrier of said double pinion planetary gear train on a side of said first electric motor through an outer peripheral side of said power-splitting planetary gear.

9. (previously presented): The hybrid driving unit as set forth in claim 7, wherein supporting members extending from said casing member support both sides of said rotor of said first electric motor through an intermediary of bearing members; and

wherein said output shaft is supported by an inner peripheral surface of said rotor of said first electric motor through an intermediary of bearing members provided at an outer peripheral surface of said output shaft.

10. (previously presented): The hybrid driving unit as set forth in claim 9, wherein said supporting members extending from said casing member support both sides of said rotor of said second electric motor through an intermediary of bearing members and said input shaft is supported by an inner peripheral surface of said rotor of said second electric motor through an intermediary of bearing members provided at an outer peripheral surface of said input shaft.

11. (previously presented): The hybrid driving unit as set forth in claim 1, wherein said second electric motor, said transmission, said first electric motor and said power-splitting planetary gear are disposed in order from a side of the vehicle closest to said internal combustion engine.

12. (previously presented): The hybrid driving unit as set forth in claim 11, wherein said input shaft passes through an inner peripheral side of said second electric motor, said transmission, said first electric motor and said power-splitting planetary gear;

wherein said input shaft is coupled with said first rotary element;

wherein said output shaft passes through an outer peripheral side of said power-splitting planetary gear;

wherein an output element of said transmission passes through an inner peripheral side of said first electric motor and said power-splitting planetary gear; and

wherein said output element is coupled with said output shaft.

13. (previously presented): The hybrid driving unit as set forth in claim 12, wherein said power-splitting planetary gear comprises a double pinion planetary gear train;

wherein said input shaft is coupled with a ring gear of said double pinion planetary gear train through a back side of said power-splitting planetary gear;

wherein said output shaft is coupled with said carrier of said double pinion planetary gear train on a side of said first electric motor;

wherein said rotor of said first electric motor is coupled with said sun gear of said double pinion planetary gear train; and

wherein said output element of said transmission is coupled with the rear side of said carrier of said double pinion planetary gear train through the inner peripheral side of said power-splitting planetary gear.

14. (previously presented): The hybrid driving unit as set forth in claim 11, wherein supporting members extending from said casing member support both sides of said rotor of said first electric motor through an intermediary of bearing members; and

wherein an output element of said transmission is supported by an inner peripheral surface of said rotor of said first electric motor through an intermediary of bearing members provided on an outer peripheral surface thereof.

15. (previously presented): The hybrid driving unit as set forth in claim 11, wherein supporting members extending from said casing member support both sides of said rotor of said second electric motor through an intermediary of bearing members; and

wherein said input shaft is supported by an inner peripheral surface of said rotor of said second electric motor and by an inner peripheral surface of an output element of said transmission through an intermediary of bearing members provided on an outer peripheral surface of said input shaft.

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16. (previously presented): The hybrid driving unit as set forth in claim 15, wherein one of said supporting members between said second electric motor and said transmission, forms a hydraulic chamber of a hydraulic actuator of said transmission.

17. (previously presented): The hybrid driving unit as set forth in claim 1, wherein said transmission comprises a planetary gear unit.

18. (previously presented): The hybrid driving unit as set forth in claim 17, wherein said transmission comprises at least four shifting elements;

wherein a first shifting element is coupled with said rotor of said second electric motor;

wherein a second shifting element is coupled with said output shaft; and

wherein said transmission comprises braking elements which are capable of fixing a third shifting element and a fourth shifting element to said casing member.

19. (previously presented): The hybrid driving unit as set forth in claim 17, wherein said planetary gear unit of said transmission comprises a Ravigneaux type planetary gear; and

wherein a carrier of said Ravigneaux type planetary gear is coupled with said output shaft.

20. (currently amended): A vehicle comprising:
- an internal combustion engine;
 - a hybrid driving unit; and
 - driving wheels to which a driving force is transmitted from said hybrid driving unit;
- wherein said hybrid driving unit comprises:
- an input shaft for inputting motive power from said internal combustion engine;
 - an output shaft disposed on an axis in line with said input shaft and engaged with driving wheels;
 - a first electric motor disposed on said axis and comprising a stator and a rotor;
 - a power-splitting planetary gear disposed on said axis and comprising a first rotary element coupled with said input shaft, a second rotary element coupled with said rotor of said first electric motor and a third rotary element coupled with said output shaft;
 - a second electric motor disposed on said axis and comprising a stator and a rotor; and
 - a transmission disposed on said axis which shifts and transmits a revolution of said rotor of said second electric motor to said output shaft;
- wherein said first electric motor, said power-splitting planetary gear, said second electric motor and said transmission are provided in a casing member while being disposed in line on said axis;

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wherein said stators of said first and second electric motors are fixed to said casing member; and

wherein said first electric motor, said power-splitting planetary gear, said second electric motor and said transmission are disposed on said axis such that said second electric motor and said transmission ~~is~~ are positioned on a side of a vehicle closer to said internal combustion engine than said first electric motor and said power-splitting planetary gear; and

wherein said transmission is an automatic transmission having at least two stages or a continuous variable transmission.

21. (previously presented): The vehicle according to claim 20, wherein said input shaft is coupled with a crankshaft of said internal combustion engine;

wherein a propeller shaft is coupled with said output shaft; and

wherein said crankshaft, said input shaft, said output shaft and said propeller shaft are disposed approximately on the same axial line.

22. (new): The vehicle according to claim 1, wherein said transmission comprises plural shifting elements and frictional engaging elements connected to said shifting elements;

wherein said second electric motor is disposed in a foremost position in said vehicle among said first electric motor, said power-splitting planetary gear, said second electric motor and said transmission; and

wherein said transmission is provided adjacent to said second electric motor.

23. (new): A hybrid driving unit comprising:

an input shaft for inputting motive power from an internal combustion engine;

an output shaft disposed on an axis in line with said input shaft and engaged with driving wheels;

a first electric motor disposed on said axis and comprising a stator and a rotor;

a power-splitting planetary gear disposed on said axis and comprising a first rotary element coupled with said input shaft, a second rotary element coupled with said rotor of said first electric motor, a third rotary element coupled with said output shaft, and a double pinion planetary gear train, the double pinion planetary gear train comprising a ring gear coupled with the input shaft, a sun gear coupled with the rotor of the first electric motor and a carrier coupled with the output shaft;

a second electric motor disposed on said axis and comprising a stator and a rotor; and

a transmission disposed on said axis, which shifts and transmits revolution of said rotor of said second electric motor to said output shaft;

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wherein said first electric motor, said power-splitting planetary gear, said second electric motor and said transmission are provided in a casing member while being disposed in line on said axis;

wherein said stators of said first and second electric motors are fixed to said casing member;

wherein said first electric motor, said power-splitting planetary gear, said second electric motor and said transmission are disposed on said axis such that said second electric motor and said transmission are positioned on a side of a vehicle closer to said internal combustion engine than said first electric motor and said power-splitting planetary gear; and

wherein said transmission is an automatic transmission having at least two stages or a continuous variable transmission.